

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

Listing of Claims:

1. (Withdrawn) An electroless copper plating method using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, a copper ion reducing agent and a pH conditioner, wherein said method comprises steps of using the hydroxide of an alkaline earth metal as said pH conditioner to react with sulfuric ions in the electroless copper plating solution into a salt of said alkaline earth metal, removing the precipitate from the plating solution, measuring at least one of the concentration of sulfuric ion and the concentration of oxalic ion in the plating solution and keeping an optimum sulfuric ion or oxalic ion concentration during an electroless copper plating .
  
2. (Withdrawn) An electroless copper plating method using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and pH conditioner, wherein said method comprises steps of using alkaline earth metal hydroxide as said pH conditioner, precipitating and removing sulfuric and oxalic ions as salts of said alkaline earth metal in the electroless plating solution during electroless copper plating.

3. (Withdrawn) An electroless copper plating method using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, a copper ion reducing agent, and a pH conditioner, wherein said method comprises steps of adding at least one of alkaline earth metal, alkaline earth metal oxide, alkaline earth metal hydroxide, and alkaline earth metal salt (excluding sulfuric salt) into said plating solution, reacting with and precipitating sulfuric ions as an alkaline earth metal salt, measuring the concentration of sulfuric ions in said plating solution, and regulating the concentration thereof to a preset optimum concentration during electroless copper plating.

4. (Withdrawn) An electroless copper plating method using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and a pH conditioner, wherein said method comprises steps of adding at least one of alkaline earth metal, alkaline earth metal oxide, alkaline earth metal hydroxide, and alkaline earth metal salt (excluding sulfuric salt) into said plating solution, and reacting with and precipitating sulfuric ions or oxalic ion as an alkaline earth metal salt during electroless copper plating.

5. (Previously Presented) An electroless copper plating machine using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and a pH conditioner, wherein said machine comprises an electroless copper plating bath for

containing an electroless copper plating solution, a reaction bath which adds at least one of alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, and alkaline earth metal salt (excluding sulfuric salt) to said copper plating solution therein to react with and precipitate sulfuric ions and oxalic ion as alkaline earth metal salt precipitate in said plating solution, and a filter unit for separating said metal salt precipitate.

6. (Previously Presented) An electroless copper plating machine using a plating solution containing copper sulfate as copper ion sources, and copper ion complex agent, a copper ion reducing agent, and a pH conditioner, wherein said machine comprises an electroless copper plating bath for containing a copper plating solution, a reaction bath which adds at least one of alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, and alkaline earth metal salt (excluding sulfuric salt) to said copper plating solution therein to react with and precipitate sulfuric ions as an alkaline earth metal salt precipitate in said plating solution, a filter unit for separating said metal salt precipitate, means for measuring the concentration of sulfuric ion in said plating solution, and means for comparing said measured concentration by a preset reference concentration and controlling the quantity of said alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, or alkaline earth metal salt (excluding sulfuric salt) to be added.

7. (Previously Presented) An electroless copper plating machine using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and a pH

conditioner, wherein said machine comprises an electroless copper plating bath for containing a copper plating solution, a reaction bath which adds at least one of alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, and alkaline earth metal salt (excluding sulfuric salt) to said copper plating solution therein to react with and precipitate sulfuric ion as an alkaline earth metal salt precipitate in said plating solution, a filter unit for separating said alkaline earth metal salt precipitate, means for measuring at least one of the sulfuric ion concentration and the oxalic ion concentration and means for comparing at least one of said measured sulfuric and oxalic concentrations by a preset reference concentration and controlling the quantity of said alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, or alkaline earth metal salt (excluding sulfuric salt) to be added.

8. (Withdrawn) An electroless copper plating machine using a plating solution containing metallic ions, an agent for reducing said metallic ions, and a pH conditioner, wherein said machine comprises an electroless copper plating bath, a reaction bath adding a metal or a compound containing a metal to said plating solution to precipitate ions, as a metal salt precipitate, which suppress generation of said plating metal as metal salts, and an ultra filtration unit for removing said metal salt precipitate.

9. (Currently Amended) An electroless copper plating machine in accordance with any one of Claim 5 through Claim [[8]] 7, wherein said filtration filter unit is a cross-flow ultra filtration unit or a filter press ultra filtration unit.

10. (Withdrawn) A multi-layer wiring board having insulating layers and circuit layers accumulated and cemented alternately whose circuit layers are electrically connected by copper-plated through-holes which pass through the insulating layer between said circuit layers or by copper-plated via-holes whose one end is closed, wherein said plating is made by An electroless copper plating method in accordance with Claim 1 through Claim 4.

11. (Withdrawn) A module having one or more semiconductor elements on said multi-layer wiring board in accordance with Claim 10.